

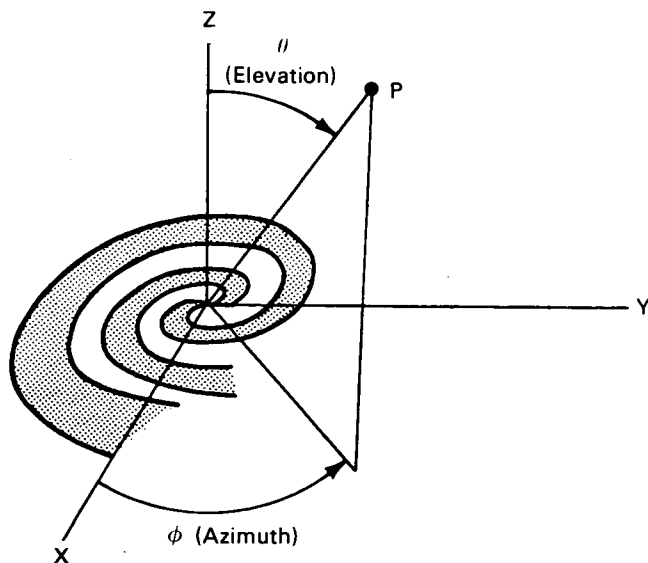
NASA TECH BRIEF



NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Division, NASA, Code UT, Washington, D.C. 20546.

Electronic Scanning of 2-Channel Monopulse Patterns

Planar log spiral antennas, with their multi-mode operating capability, broadband characteristics, and circular polarization, are finding application in tracking networks employing large parabolic reflectors.



Polar Coordinate System for Describing Radiation Patterns

To electronically scan the monopulse patterns associated with 2-channel monopulse antennas, a method has been devised by which the scanning capability has been separated into two independent degrees of freedom. One degree of freedom corresponds to elevation scanning on the spiral coordinate axes, and the other corresponds to azimuthal scanning (see figure). Since elevation is determined solely through amplitude comparison in spiral antennas, and azimuth through phase comparison, this scanning technique involves an amplitude-scanning component and a phase-scanning component totally independent of each other.

Scanning of both prime-feed and mirrored patterns has been accomplished with an attendant reduction of mechanical vibration damage to large antennas, plus an enhancement of reception in the presence of path slewing due to interference effects. Additionally, this technique has resulted in a reduction of telemetry-channel signal variations due to finite servo response time and rapid target-following capability as in aircraft fire control radar.

Note:

The following documentation may be obtained from:

Clearinghouse for Federal Scientific
and Technical Information
Springfield, Virginia 22151
Single document price \$3.00
(or microfiche \$0.65)

Reference:

NASA-TM-X-55580 (N67-11362), A Two-Channel Monopulse Reflector Antenna System with a Multimode Logarithmic Spiral Feed

NASA-TM-X-55938 (N70-72148), Analysis of Electronic Methods of Spiral Antenna Scanning

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

Source: R.F. Schmidt
Goddard Space Flight Center
(GSC-10299)
Category 02